

# **Mumps and Mumps Vaccine**

**Epidemiology and Prevention of Vaccine-  
Preventable Diseases**

**National Center for Immunization and  
Respiratory Diseases  
Centers for Disease Control and Prevention**

Revised March 2012

## **Note to presenters:**

**Images of vaccine-preventable diseases are available from the Immunization Action Coalition website at <http://www.vaccineinformation.org/photos/index.asp>**

# Mumps

- ❑ **Acute viral illness**
- ❑ **Parotitis and orchitis described by Hippocrates in 5th century BCE**
- ❑ **Viral etiology described by Johnson and Goodpasture in 1934**
- ❑ **Frequent cause of outbreaks among military personnel in prevaccine era**

# **Mumps Virus**

- ❑ Paramyxovirus**
- ❑ RNA virus**
- ❑ One antigenic type**
- ❑ Rapidly inactivated by chemical agents, heat, and ultraviolet light**

# **Mumps Pathogenesis**

- ❑ **Respiratory transmission of virus**
- ❑ **Replication in nasopharynx and regional lymph nodes**
- ❑ **Viremia 12-25 days after exposure with spread to tissues**
- ❑ **Multiple tissues infected during viremia**

## **Mumps Clinical Features**

- ❑ Incubation period 14-18 days**
- ❑ Nonspecific prodrome of myalgia, malaise, headache, low-grade fever**
- ❑ Parotitis in 30%-40%**
- ❑ Up to 20% of infections asymptomatic**

## **Mumps Complications**

<b>CNS involvement</b>	<b>15% of clinical cases</b>
<b>Orchitis</b>	<b>20%-50% in post-pubertal males</b>
<b>Pancreatitis</b>	<b>2%-5%</b>
<b>Deafness</b>	<b>1/20,000</b>
<b>DeathAverage</b>	<b>1 per year (1980 – 1999)</b>

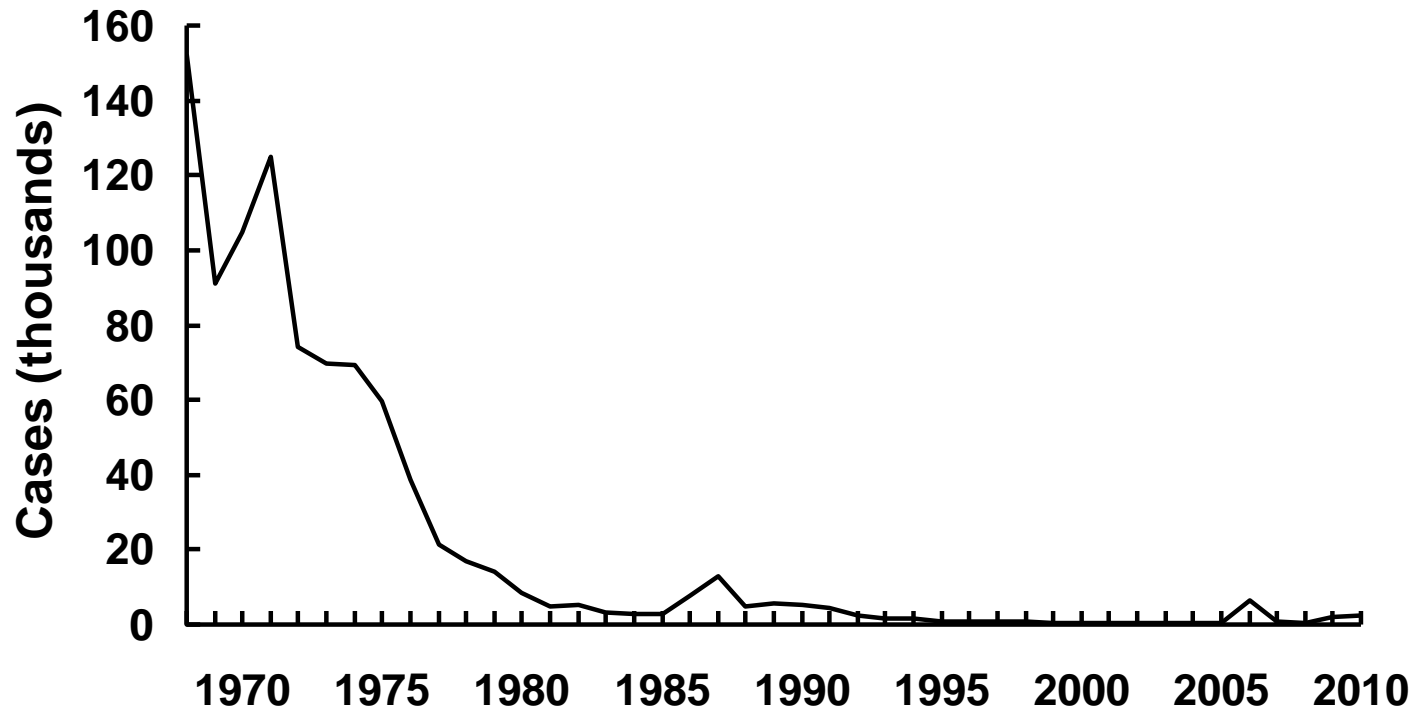
# **Mumps Laboratory Diagnosis**

- ❑ Isolation of mumps virus**
- ❑ Detection of mumps antigen by PCR**
- ❑ Serologic testing**
  - positive IgM antibody
  - significant increase in IgG antibody between acute and convalescent specimens

## **Mumps Clinical Features**

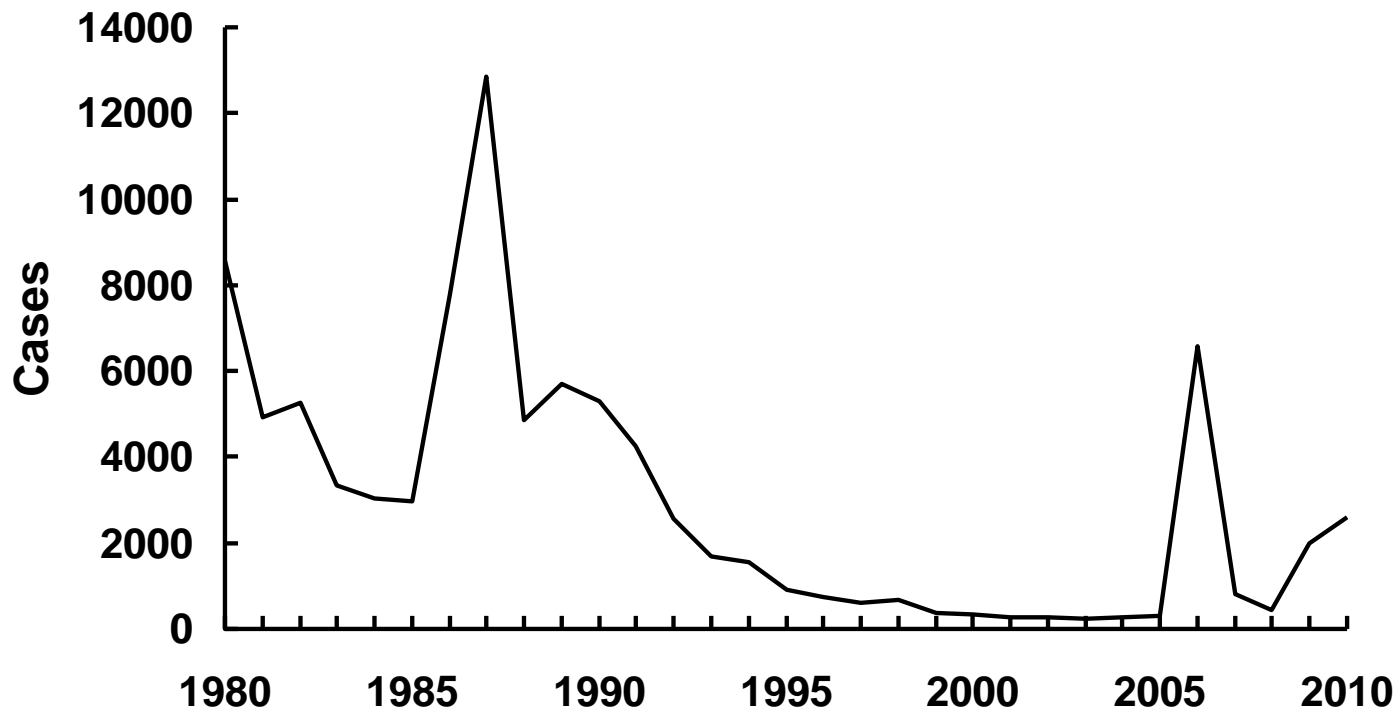
- ❑ Reservoir** **Human Asymptomatic infections may transmit**
- ❑ Transmission** **Respiratory drop nuclei**
- ❑ Temporal pattern** **Peak in late winter and spring**
- ❑ Communicability** **Three days before to four days after onset of active disease**

## Mumps—United States, 1968-2010



Source: National Notifiable Disease Surveillance System, CDC

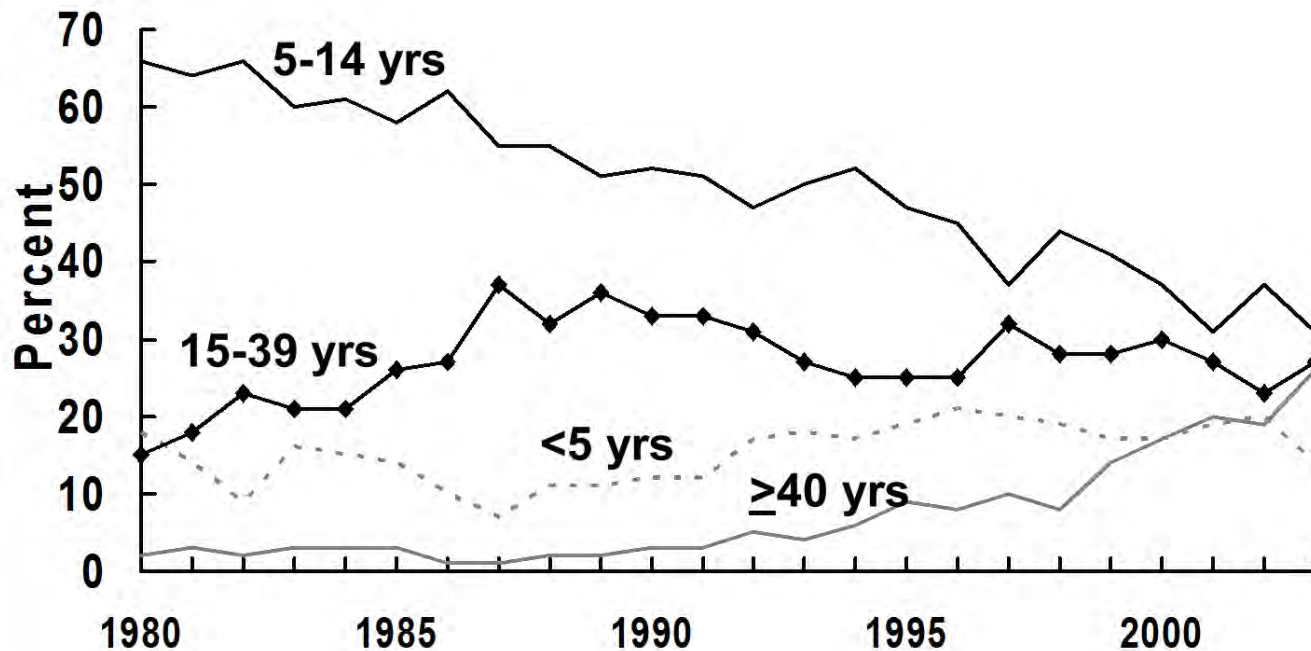
## Mumps—United States, 1980-2010



Source: National Notifiable Disease Surveillance System, CDC

# Mumps—United States, 1980-2003

## Age Distribution of Reported Cases



Source: National Notifiable Disease Surveillance System, CDC

## **Mumps, 2006**

- ❑ Largest mumps outbreak in twenty years**
- ❑ More than 6,500 cases reported from 45 states and Washington D.C.**
- ❑ Eight Midwest states accounted for 85% of the cases reported**
- ❑ Majority had received 2 doses of MMR vaccine**

## **Mumps – United States, 2009-2010**

- ❑ **More than 3,500 outbreak-related cases of mumps were reported in Orthodox Jewish communities in New York and New Jersey**
  - students in middle and high school had the highest mumps incidence
  - majority had received 2 doses of MMR vaccine
- ❑ **2010 Guam outbreak (more than 500 cases)**

## **Mumps Clinical Case Definition**

- Acute onset of unilateral or bilateral tender, self-limited swelling of the parotid or other salivary gland lasting more than 2 days without other apparent cause**

## **Mumps Vaccine**

- ❑ Composition      Live virus (Jeryl Lynn strain)**
- ❑ Efficacy            80% (1 dose)**
- ❑ Duration of Immunity      Lifelong**
- ❑ Schedule            At least 1 Dose**
- ❑ Should be administered with measles and rubella as MMR or with measles, rubella and varicella as MMRV**
- ❑ Single antigen vaccine not available in the United States**

## **MMRV (ProQuad)**

- ❑ **Combination measles, mumps, rubella and varicella vaccine**
- ❑ **Approved children 12 months through 12 years of age (up to age 13 years)**
- ❑ **Titer of varicella vaccine virus in MMRV is more than 7 times higher than standard varicella vaccine**

## **Mumps (MMR) Vaccine Indications**

- ❑ **One dose (as MMR) for preschool-age children 12 months of age and older and persons born during or after 1957 not at high risk of mumps exposure**
- ❑ **Second dose (as MMR) for school-age children and adults at high risk of mumps exposure (i.e., healthcare personnel, international travelers and students at post-high school educational institutions)**

## **MMR and MMRV Vaccine**

- ❑ For the first dose of measles, mumps, rubella, and varicella vaccines either MMR and varicella vaccines or MMRV vaccine can be used**
- ❑ Providers should discuss the benefits and risks of both vaccination options with the parents or caregivers**
- ❑ Unless the parent or caregiver expresses preference for MMRV, CDC recommends using MMR and varicella vaccines for the first dose.**
- ❑ Providers who face barriers to clearly communicating benefits and risks for any reason, such as language barriers, should administer MMR and varicella vaccines separately**

## **MMR and MMRV Vaccine**

- For the first dose of measles, mumps, rubella, and varicella vaccines administered at 48 months of age or older, and for second dose at any age, use of MMRV vaccine generally is preferred over separate injections of MMR and varicella vaccines**

## **Mumps Immunity**

- ❑ Documentation of adequate vaccination**
- ❑ Serologic evidence of mumps immunity**
- ❑ Birth before 1957**
- ❑ Documentation of physician- diagnosed mumps  
(not acceptable for HCP)**

## **Mumps Immunity**

- ❑ **Healthcare facilities should strongly consider recommending 1 dose of mumps-containing vaccine to unvaccinated workers born before 1957 who do not have other evidence of mumps immunity**

## **MMR Vaccine Contraindications and Precautions**

- ❑ Severe allergic reaction to vaccine component or following prior dose**
- ❑ Pregnancy**
- ❑ Immunosuppression**
- ❑ Moderate or severe acute illness**
- ❑ Recent blood product**
- ❑ Personal or family (i.e., sibling or parent) history of seizures of any etiology (MMRV only)**

# **Measles and Mumps Vaccines and Egg Allergy**

- ❑ Measles and mumps viruses grown in chick embryo fibroblast culture**
- ❑ Studies have demonstrated safety of MMR in egg allergic children**
- ❑ Vaccinate without testing**

## MMR Adverse Reactions

❑ <b>Fever</b>	<b>5%-15%</b>
❑ <b>Rash</b>	<b>5%</b>
❑ <b>Joint symptoms</b>	<b>25%</b>
❑ <b>Thrombocytopenia</b>	<b>&lt;1/30,000 doses</b>
❑ <b>Parotitis*</b>	<b>rare</b>
❑ <b>Deafness*</b>	<b>rare</b>
❑ <b>Encephalopathy</b>	<b>&lt;1/1,000,000 doses</b>

\*reactions usually attributed to the mumps component

## **MMRV Adverse Reactions**

- ❑ MMRV has higher risk for fever and febrile seizures 5-12 days after the first dose among children 12-23 months of age**
- ❑ 1 additional febrile seizure for every 2,300-2,600 MMRV vaccine doses administered**

## **MMR Vaccine and Autism**

- ❑ **There is no scientific evidence that the risk of autism is higher among children who receive measles or MMR vaccine than among unvaccinated children**

## **MMR Vaccine and Autism**

**“The evidence favors a rejection of a causal relationship at the population level between MMR vaccine and autism spectrum disorders (ASD).”**

**- Institute of Medicine, April 2001**

## **Vaccine Storage and Handling MMR Vaccine**

- ❑ Store 35o - 46°F (2° - 8°C) (may be stored in the freezer)**
- ❑ Store diluent at room temperature or refrigerate**
- ❑ Protect vaccine from light**
- ❑ Discard if not used within 8 hours reconstitution**

## **Vaccine Storage and Handling MMRV Vaccine**

- ❑ Must be stored at an average temperature of 5oF (-15oC ) or colder at all times**
- ❑ May be stored at refrigerator temperature for up to 72 hours but must then be discarded if not used (do not refreeze)**
- ❑ Must be administered within 30 minutes of reconstitution or must be discarded**

# CDC Vaccines and Immunization

## Contact Information

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Website

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